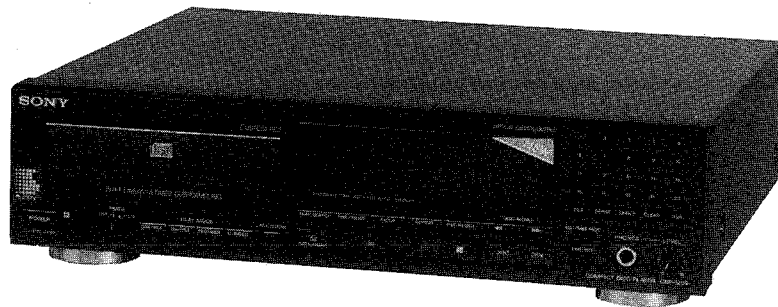


CDP-M99

SERVICE MANUAL

*AEP Model
UK Model*



SPECIFICATIONS

Compact disc player

Frequency response	2 Hz — 20 kHz ± 0.5 dB
Signal to noise ratio	More than 104 dB
Dynamic range	More than 97 dB
Harmonic distortion	Less than 0.003%
Channel separation	More than 100 dB

Outputs

LINE OUT (FIXED) (phono jacks)	Output level 2 V (at 50 kilohms) Load impedance over 10 kilohms
DIGITAL OUT (OPTICAL) (optical output connector)	Wave length 660 nm Output level — 18 dBm
HEADPHONES (Stereo phone jack)	Output level max. 15 mW Load impedance 32 ohms

General

Power requirements	Model for Continental Europe 220 V AC (or 240 V AC adjustable by Sony personnel), 50/60 Hz Model for the United Kingdom 240 V AC (or 220 V AC adjustable by Sony personnel), 50/60 Hz
Power consumption	15 W
Dimensions (approx., including projections)	355×95×310 mm (w/h/d) (14×3 ³ / ₄ ×12 ¹ / ₄ inches)
Weight (approx.)	3.5 kg (7 lbs 15 oz)

Remote commander

Remote control system	Infrared control
Power requirements	3 V DC with two batteries size AA (IEC designation R6)
Dimensions	67×18×175 mm (w/h/d) (2 ³ / ₄ × ²³ / ₃₂ ×7 inches)
Weight	150 g (5.3 oz) Including batteries

Supplied accessories

Connecting cord	1 (2 phono plugs ↔ 2 phono plugs)
Remote commander	1
R6 (size AA) batteries	2

Optional accessory

Audio optical connecting cord POC-15

Design and specifications subject to change without notice.



COMPACT DISC PLAYER
SONY®

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Notes on chip component replacement

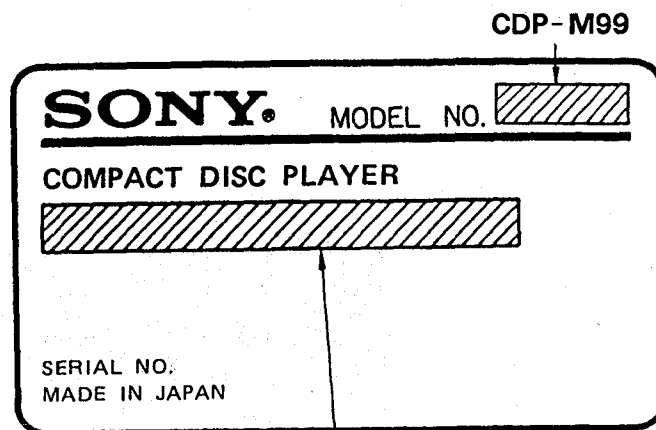
- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

MODEL IDENTIFICATION

— Specification Labels —



AEP Model: 220V ~50/60Hz

UK Model: 240V ~50/60Hz

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.

During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts.

The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe more than 30 cm away from the objective lens.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

1. Laser Diode Properties

- Material: GaAlAs
- Wavelength: 780 nm
- Emission Duration: continuous
- Laser Output: max. 44.6 μ W*

* This output is the value measured at a distance of about 200 mm from the objective lens surface on the Optical Pick-up Block.

2. During service, do not take the Optical Pick-up Block apart, and do not adjust the APC circuit. If there is a breakdown in the APC circuit (including laser diode), replace the entire Optical Pick-up Block (including APC board).

BESKYTTELSE AF ØJNE MOD LASERSTRÅLING UNDER SERVICE

I dette apparat anvendes laserlys. Derfor skal nedenstående instruktioner nøje følges under service.

Følg iverigt instruktionerne i servicemanualen.

ADVARSEL!!

Under service må øjnene ikke komme nær objektiv-linsen på den optiske pick-up enhed. I tilfælde af at det er nødvendigt at kontrollere udsendelsen af laserlys, skal det ske i en afstand af mere end 25 cm fra den optiske pick-up.

1. Laser-dioe data

- Materiale: GaAlAs
- Bølgelængde: 780 nm
- Udstråling: Kontinuerlig
- Laseroutput: Max. 0,4 mW*

* Målt i 1,6 mm afstand fra overfladen af objektiv-linsen på den optiske pick-up enhed.

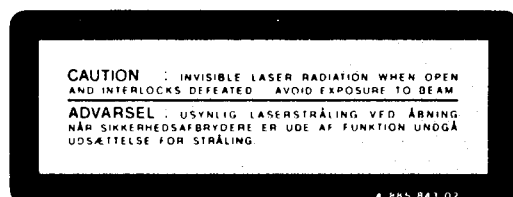
- Klassifikation: Klasse IIIb.

2. Adskil aldrig den optiske pick-up enhed under service, og juster ikke APC kredsløbet (Automatic Power Control). Hvis APC kredsløbet (incl. laserdioden) bryder ned, skal hele den optiske pick-up enhed (incl. APC printkortet) udskiftes.

LASER ADVARSEL MÆRKNING

Følgende mærkning findes indvendig i apparatet:

1. Advarsel Mærkning



VAROITUS: Laite sisältää, laserdiodin, joka lähettää (näkyvätöntä) silmille vaarallista lasersäteilyä.

SECTION 3

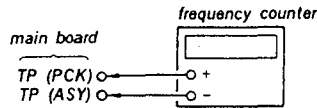
ELECTRICAL ADJUSTMENTS

ELECTRICAL ADJUSTMENTS

1. Perform adjustments in the order given.
2. Use YEDS-18 (Part No: 3-702-101-01) disc unless otherwise indicated.
3. Use the oscilloscope with more than 10 M Ω impedance.

RF PLL Lock Frequency Check

Procedure:

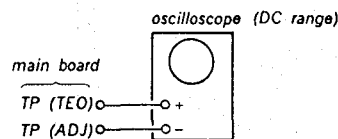


1. Put the set into test mode.
2. Connect the frequency counter to TP (PCK).
3. Turn the power on.
4. Set disc (YEDS-18) and press ▷PLAY button.
5. Confirm that the reading on frequency counter is 4.3218MHz.
6. Turn the power off.

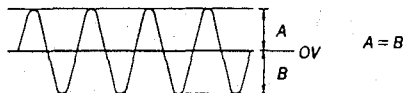
E-F Balance Check

This check should be made after replacing the optical pick-up block.

Procedure:



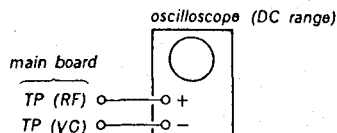
1. Put the set into test mode.
2. Connect TP (TES) to ground with lead wire.
3. Connect oscilloscope to TP (TEO).
4. Set disc (YEDS-18) and press ▷PLAY button.
5. Confirm that the traverse waveform is symmetrical about 0V-axis.
6. Turn power off and remove the lead wire connected to TP (TEO).



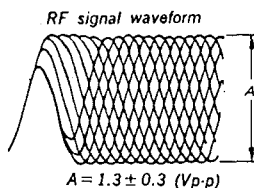
RF Level Check

This check should be made after replacing the optical pick-up block.

Procedure:



1. Put the set into test mode.
2. Connect oscilloscope to TP (RF) and TP (VC).
3. Set disc (YEDS-18) and press PLAY button.
4. Confirm that waveform eye pattern is clear and RF level is optimum. The optimum eye pattern means that shape "◇" can be clearly distinguished at the center of the waveform.
5. Turn the power off.



REFERENCE

Focus/Tracking Gain Adjustments

A frequency response analyzer is necessary in order to perform this adjustment exactly.

However, this gain has a margin, so even if it is slightly off, there is no problem. Therefore, do not perform this adjustment.

Focus/tracking gain determines the pick-up follow up (vertical and horizontal) relative to mechanical noise and shock when the 2-axis device operate.

However, as these reciprocate, the adjustment is at the point where both are satisfied.

- When gain is raised, the noise when the 2-axis device operates increases.
- When gain is lowered, mechanical shock and skipping occurs more easily.
- When gain adjustment is off, the symptoms below appear.

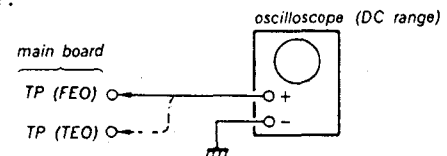
Symptoms \ Gain	Focus	Tracking
• The time until music starts becomes longer for ■ STOP → ▷ PLAY or automatic selection. (◀◀, ▶▶ buttons pressed.) (Normally takes about 1 seconds.)	low	low or high
• Music does not start and disc continues to rotate for ■ STOP → ▷ PLAY or automatic selection. (◀◀, ▶▶ buttons pressed.)	—	low
• Disc table opens shortly after ■ STOP → ▷ PLAY.	low or high	—
• Sound is interrupted during PLAY or time counter display stops progressing.	—	low
• More noise during 2-axis device operation.	high	high

The following is a simple adjustment method.

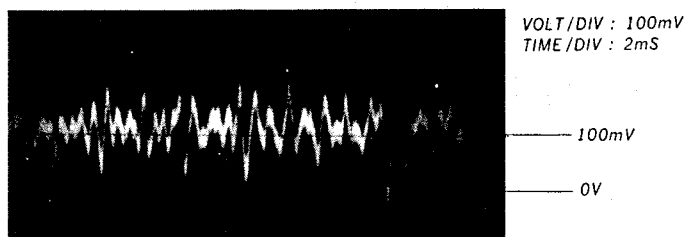
—Primary Adjustment—

Note: Since exact adjustment cannot be performed, remember the positions of the controls before performing the adjustment. If the position after the primary adjustment are only a little different, return the controls to the original position.

Procedure:

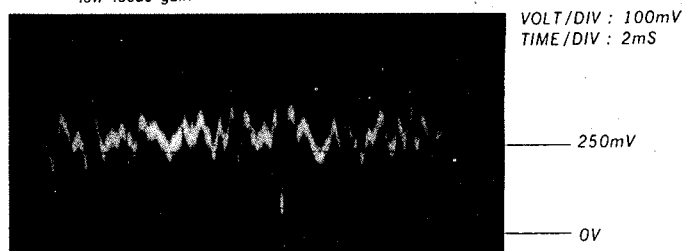


1. Keep the set horizontal.
(If the set is not horizontal, this adjustment cannot be performed due to the gravity against the 2-axis device.)
2. Put the set into test mode.
3. Set disc (YEDS-18) and turn POWER switch on.
4. Connect oscilloscope to main amp board TP (FEO).
5. Adjust RV102 so that the waveform is as shown in the figure below. (focus gain adjustment)

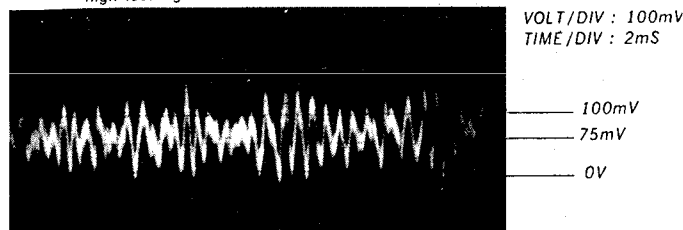


- Incorrect Examples (DC level changes more than on adjusted waveform)

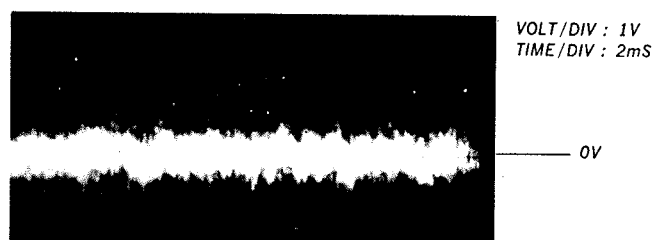
low focus gain



high focus gain

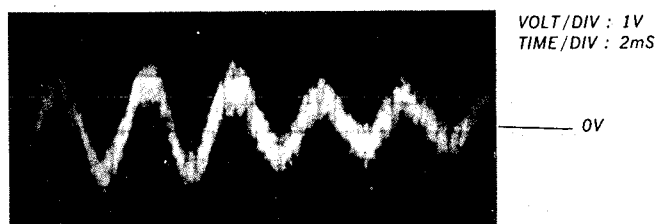


6. Connect oscilloscope to main board TP (TEO).
7. Adjust RV101 so that the waveform is as shown in the figure below. (tracking gain adjustment)
8. Turn POWER switch off.

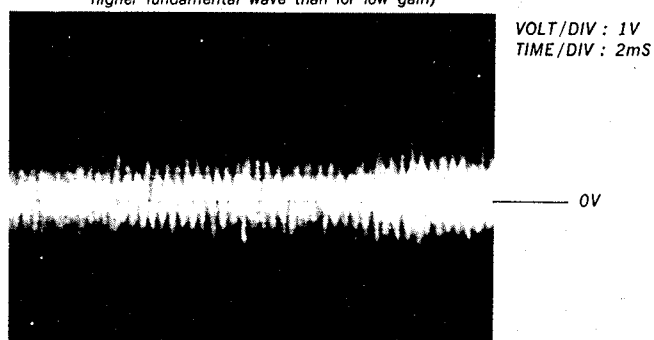


- Incorrect Examples (fundamental wave appears)

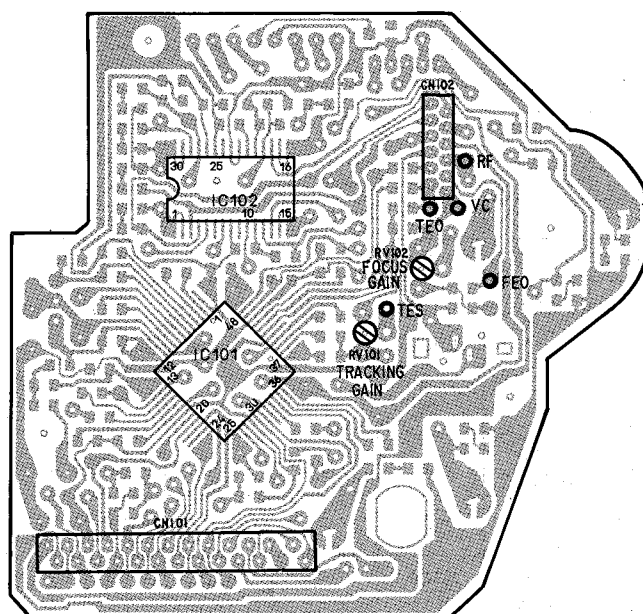
low tracking gain



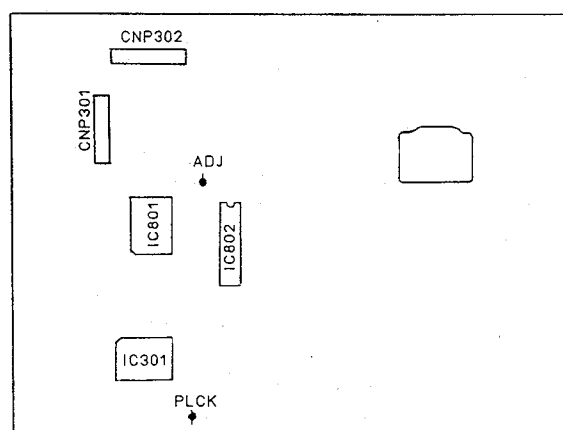
high tracking gain
higher fundamental wave than for low gain)



Adjustment point : BD Board



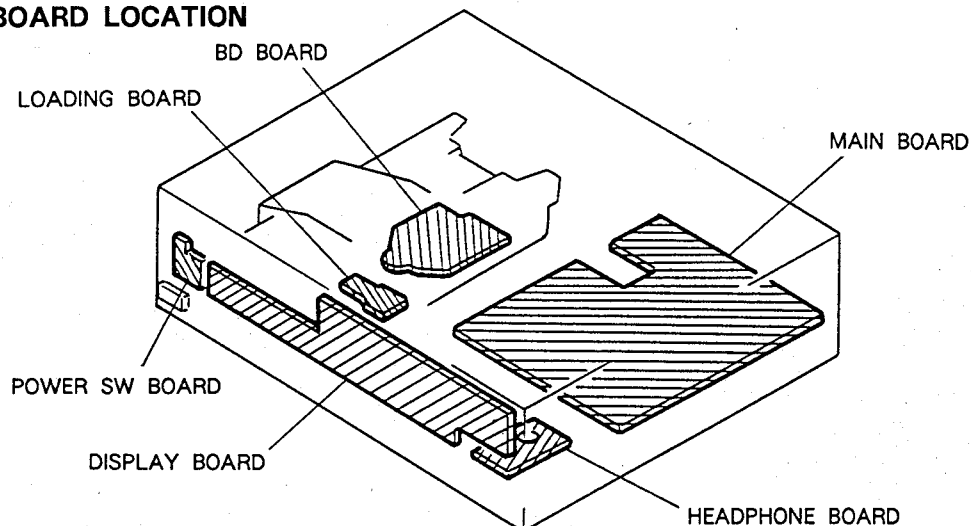
Adjustment Location : main board — component side —



SECTION 4

DIAGRAMS

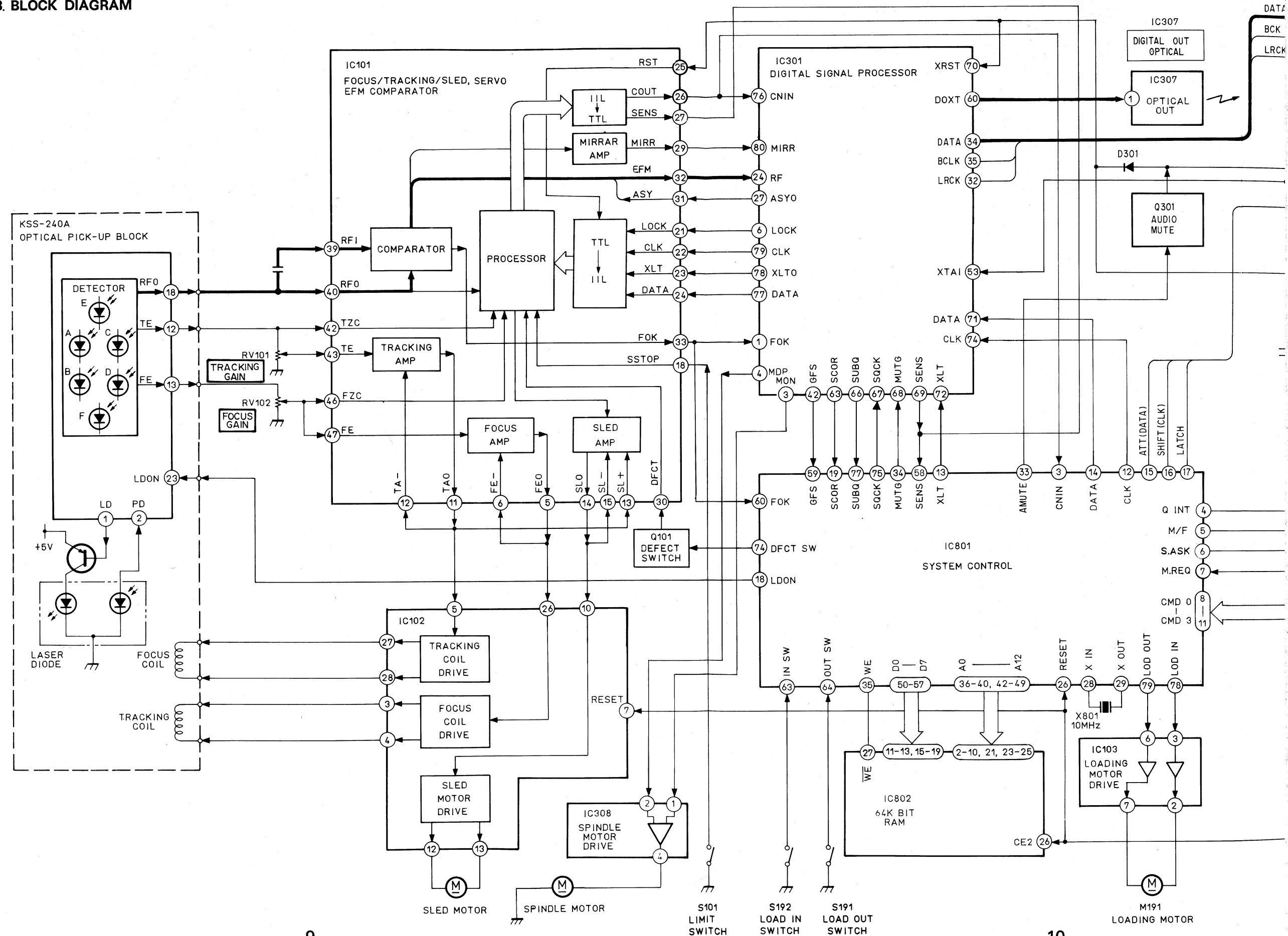
4-1. CIRCUIT BOARD LOCATION

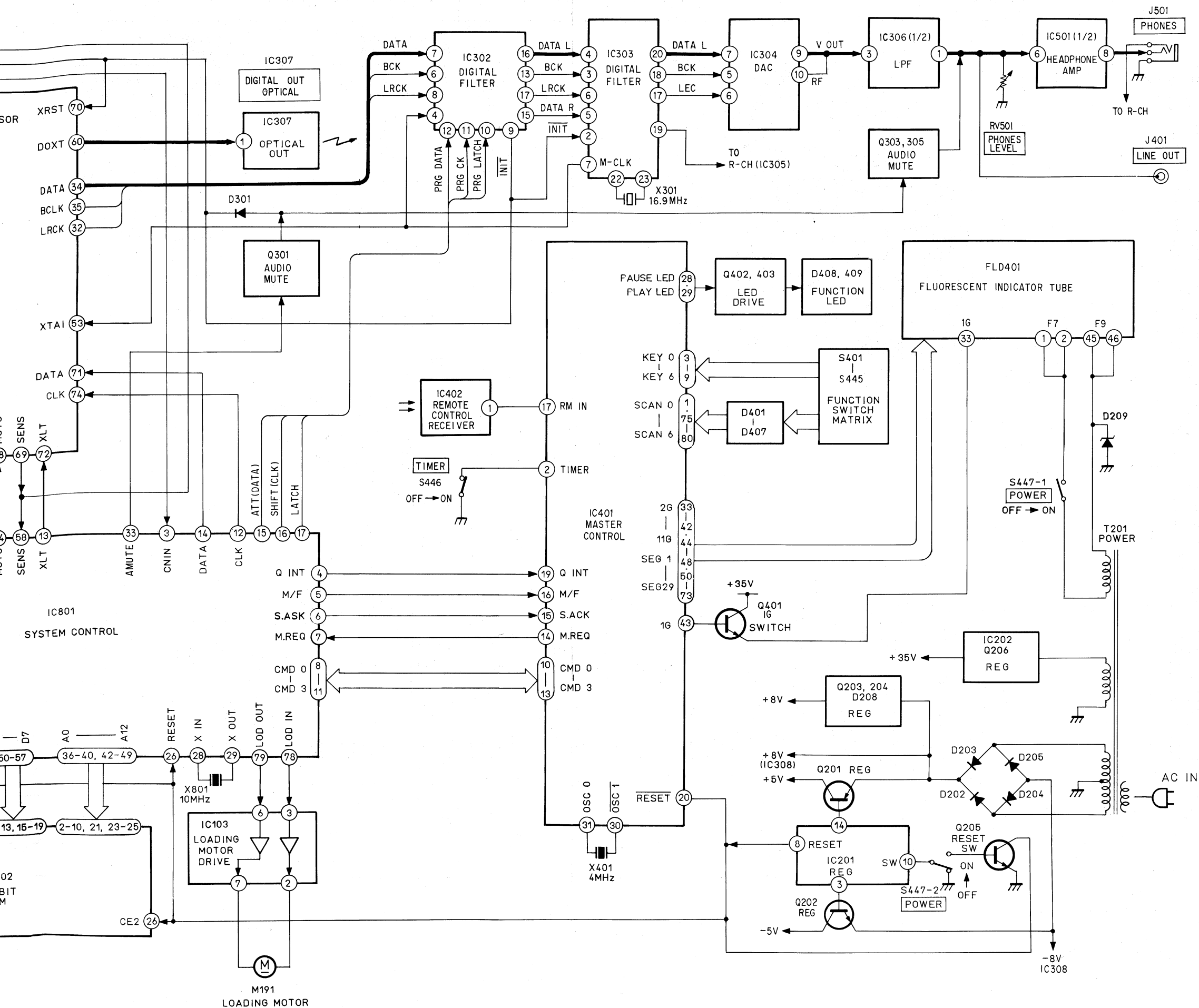


4-2. PIN DESCRIPTION ON FLOURESCENT LIGHT INDICATOR FLD401

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G
S1	1	a	a	a	a	a	a	a	a	a	a
S2	2	b	b	b	b	b	b	b	b	b	b
S3	3	c	c	c	c	c	c	c	c	c	c
S4	4	d	d	d	d	d	d	d	d	d	d
S5	5	e	e	e	e	e	e	e	e	e	e
S6	6	f	f	f	f	f	f	f	f	f	f
S7	7	g	g	g	g	g	g	g	g	g	g
S8	8	h	h	h	h	h	h	h	h	h	h
S9	9	i	i	i	i	i	i	i	i	i	i
S10	10	j	j	j	j	j	j	j	j	j	j
S11	11	k	k	k	k	k	k	k	k	k	k
S12	12	l	l	l	l	l	l	l	l	l	l
S13	13	m	m	m	m	m	m	m	m	m	m
S14	14	n	n	n	n	n	n	n	n	n	n
S15	15	o	o	o	o	o	o	o	o	o	o
S16	16	p	p	p	p	p	p	p	p	p	p
S17	17	q	q	q	q	q	q	q	q	q	q
S18	18	r	r	r	r	r	r	r	r	r	r
S19	19	s	s	s	s	s	s	s	s	s	s
S20	20	t	t	t	t	t	t	t	t	t	t
S21	—	u	u	u	u	u	u	u	u	u	u
S22	—	v	v	v	v	v	v	v	v	v	v
S23	—	w	w	w	w	w	w	w	w	w	w
S24	—	x	x	x	x	x	x	x	x	x	x
S25		SEC	46	MIN	—	—	—	REPEAT	—	—	SHUFFLE
S26	—	EDIT	54	TIME	—		1	A	—	—	PGM
S27	—	A	60		—	BANK	AUTO SPACE	B	—	—	C.INDEX
S28	—	B	90		—	INDEX	—	PEAK	—	—	(MULTI)
S29	—		DISK		—	—	INDEX	STEP	—	TRACK	(1)

4-3. BLOCK DIAGRAM



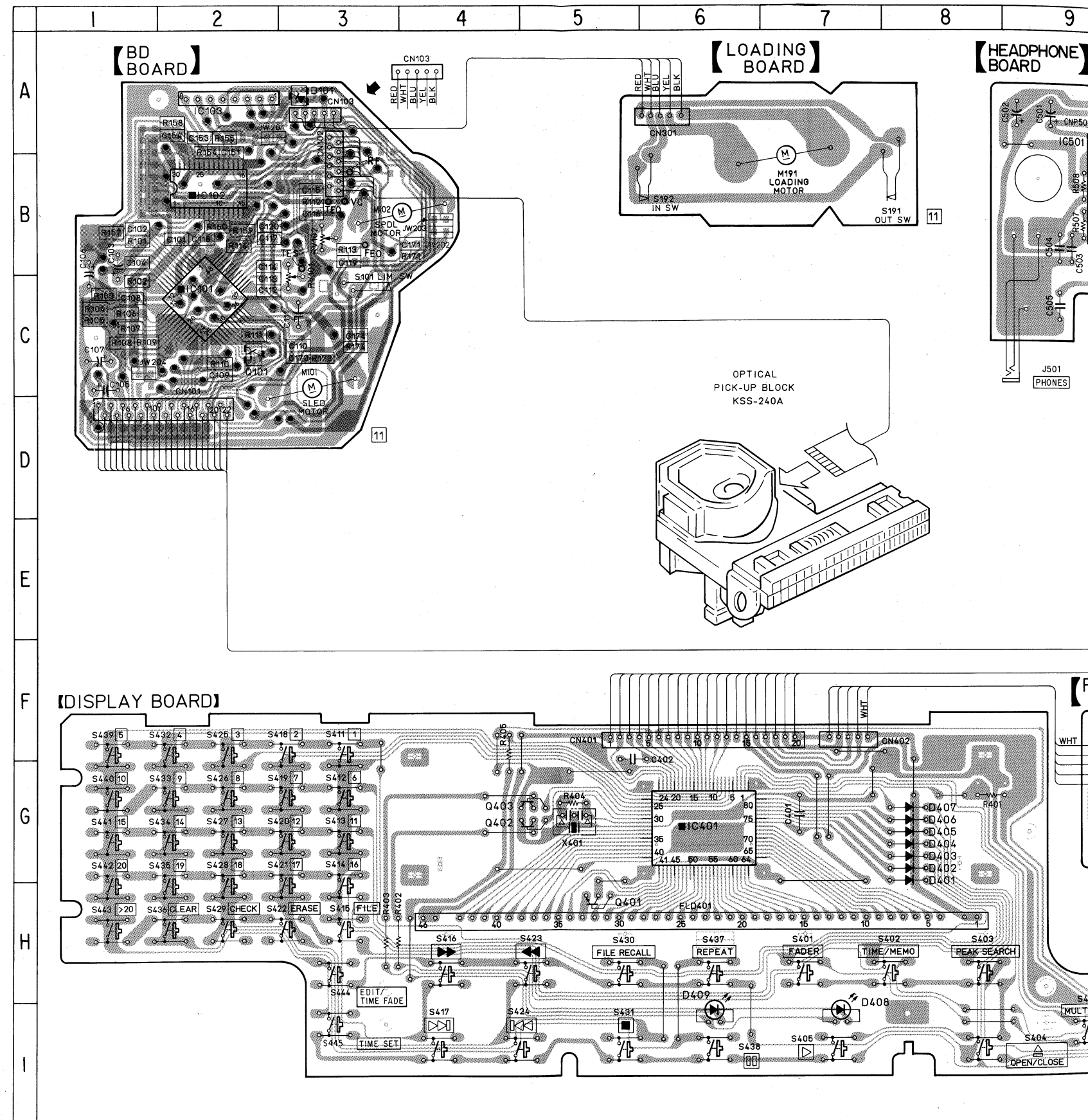


- Semiconductor Location

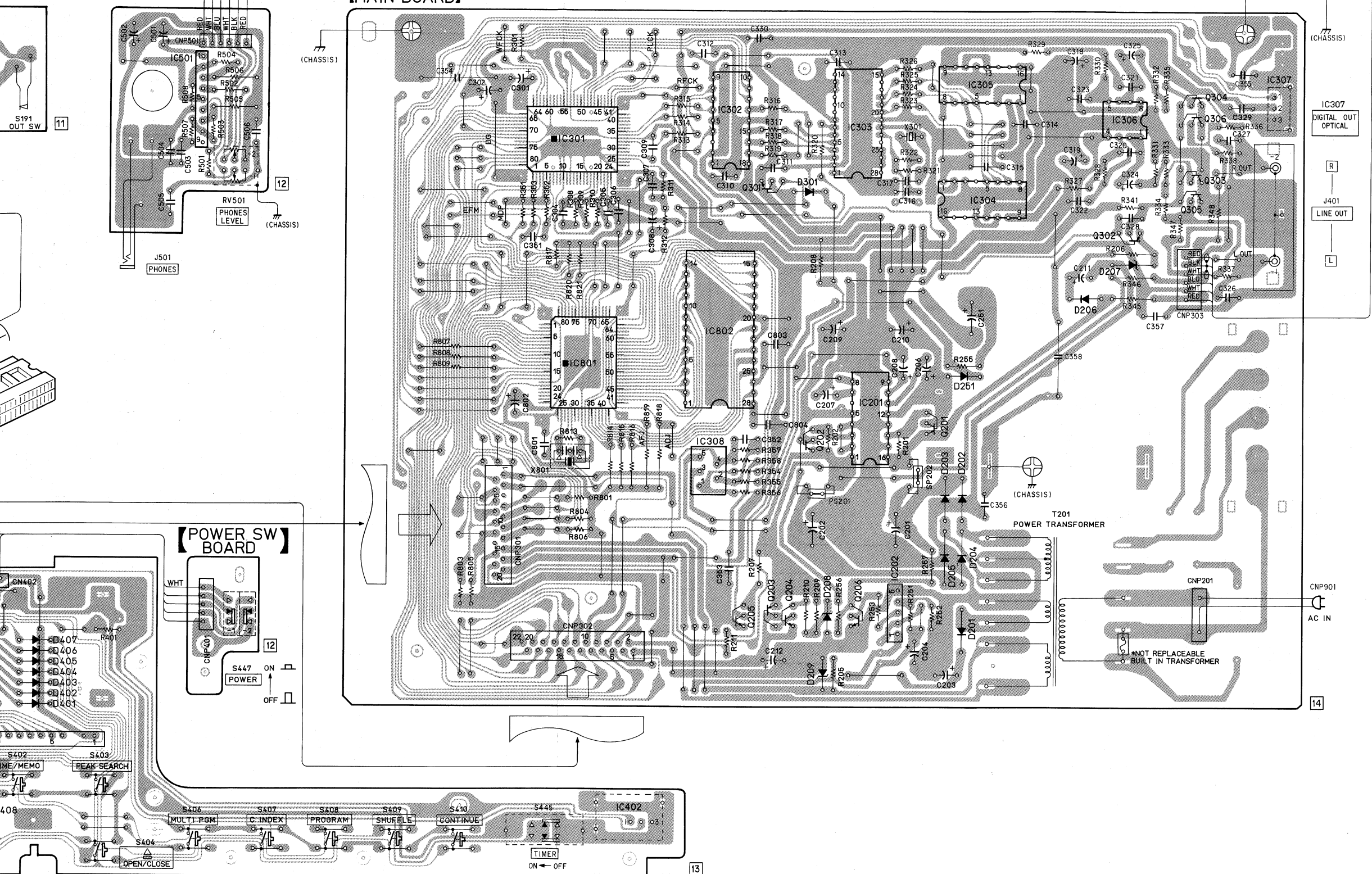
Ref. No.	Location
D101	A-3
D201	G-16
D202	E-16
D203	E-16
D204	F-16
D205	F-16
D206	C-18
D207	C-18
D208	G-15
D209	G-15
D251	D-16
D301	C-15
D302	A-19
D401	G-8
D402	G-8
D403	G-8
D404	G-8
D405	G-8
D406	G-8
D407	G-8
D408	I-7
D409	H-6
IC101	C-2
IC102	B-2
IC103	A-2
IC201	E-16
IC202	F-16
IC301	B-13
IC302	B-14
IC303	B-15
IC304	C-17
IC305	B-17
IC306	B-18
IC307	B-19
IC308	E-14
IC401	G-6
IC402	I-13
IC501	A-9
IC801	D-13
IC802	D-14
Q101	C-2
Q201	E-16
Q202	E-15
Q203	G-15
Q204	G-15
Q205	G-14
Q206	G-15
Q301	B-15
Q302	C-18
Q303	B-19
Q304	B-19
Q305	C-19
Q306	B-19
Q401	H-5
Q402	G-4
Q403	G-4

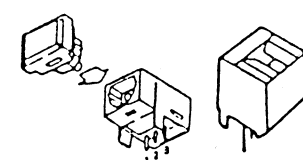
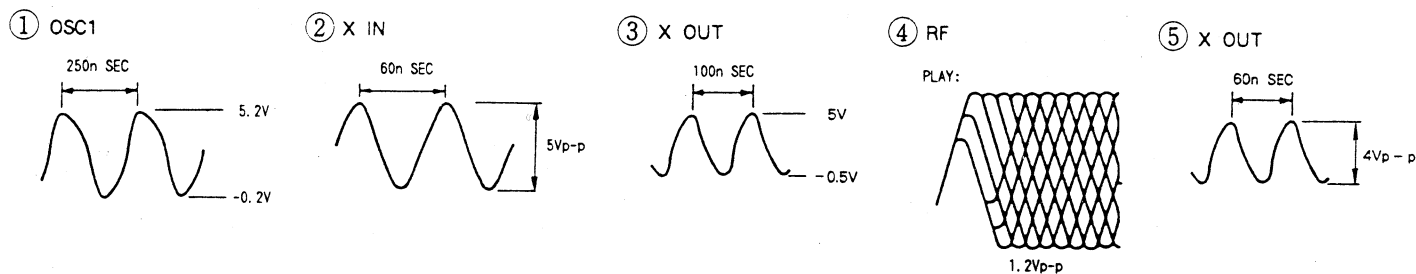
Note on Mounting Diagram:

- ○ — : parts extracted from the component side.
- ■ : parts mounted on the conductor side.
- ● : Through hole.
- ▨ : Pattern on the side which is seen.
- ▩ : Pattern of the rear side.

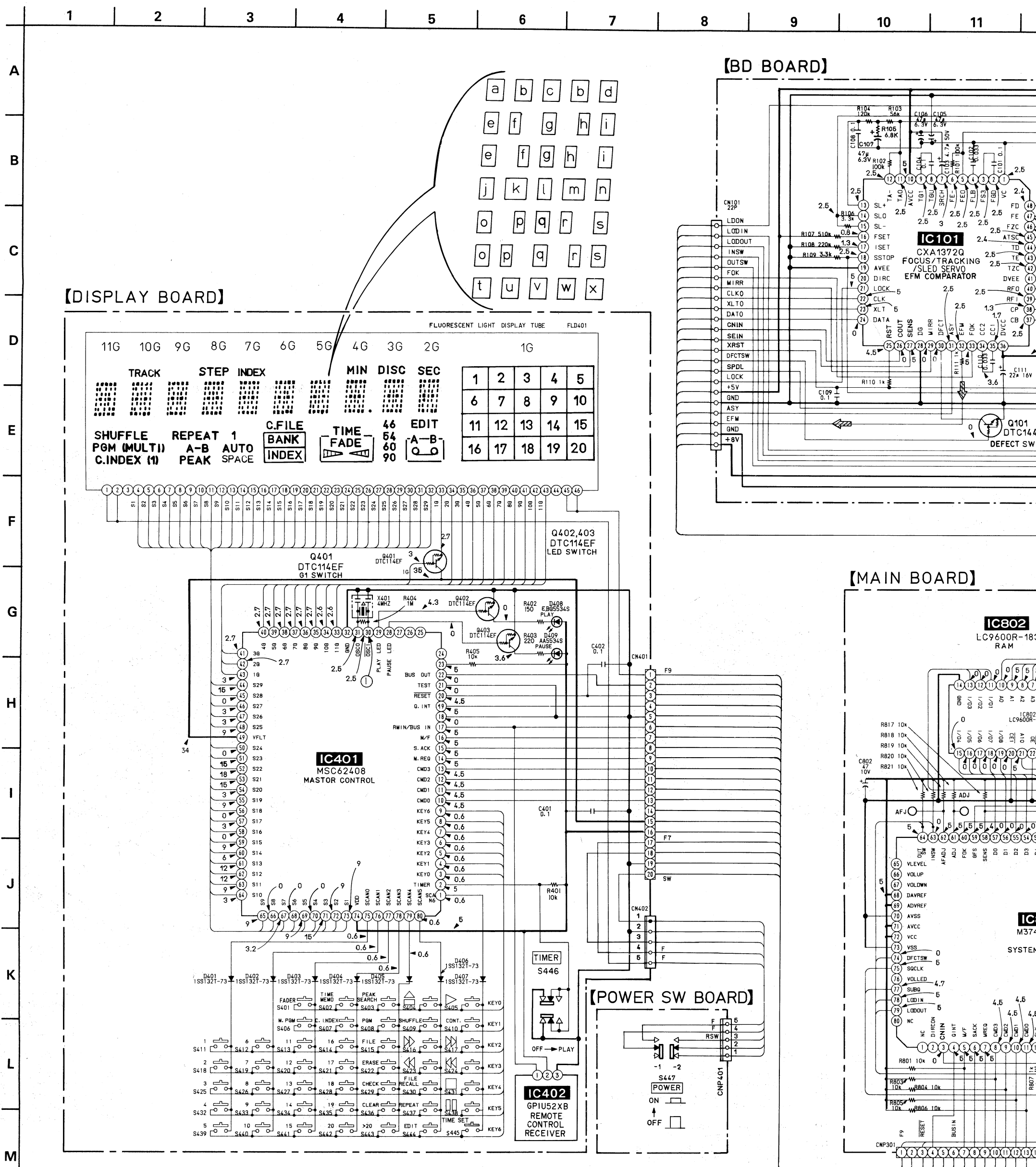


【MAIN BOARD】

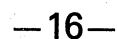


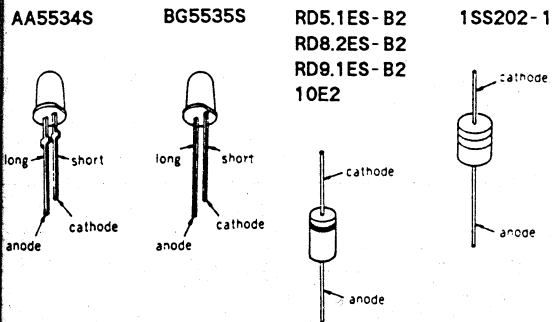


4-5. SCHEMATIC DIAGRAM



GP1F31T	GP1U52XB	M5231TL	M54641L	RC4556S	BA1L3Z - K	DTA114ES DTC114EF DTC114ES 2SC2458 - YGR	2SB1094 - L	2SD774 - 34	AA5534S	BG5535S	RD5.1ES - B2 RD8.2ES - B2 RD9.1ES - B2 10E2	1SS202 - 1





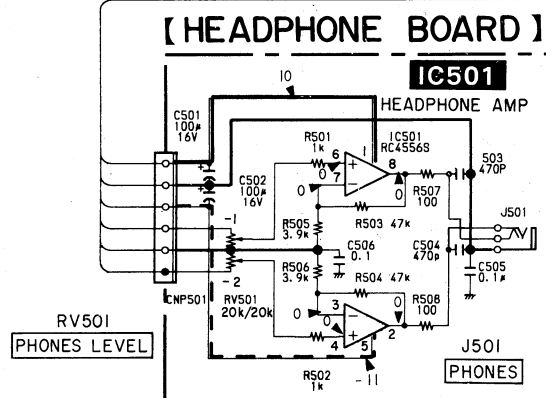
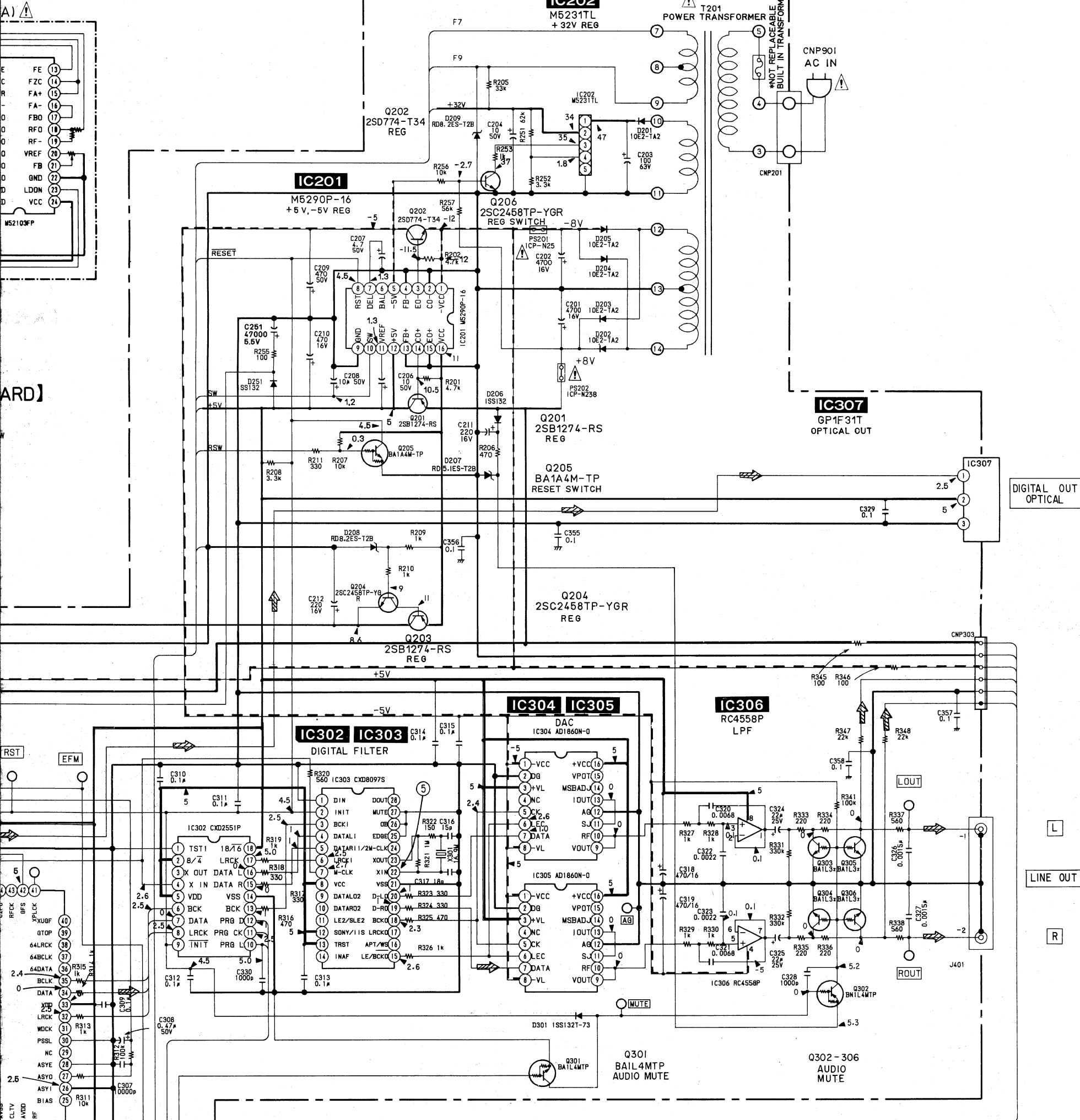
Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF : μF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
- $\triangle$: internal component.

Note: The components identified by mark $\triangle$ or dotted line with mark $\triangle$ are critical for safety. Replace only with part number specified.

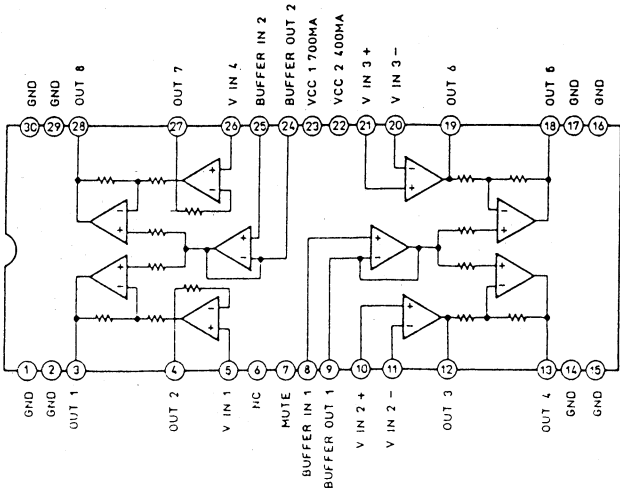
- --- : B+ Line
- --- : B- Line
- --- : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions. no mark: PLAY
- Voltages are taken with a VOM (Input impedance $10\text{M}\Omega$). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
- $\Rightarrow$: CD

UP BLOCK

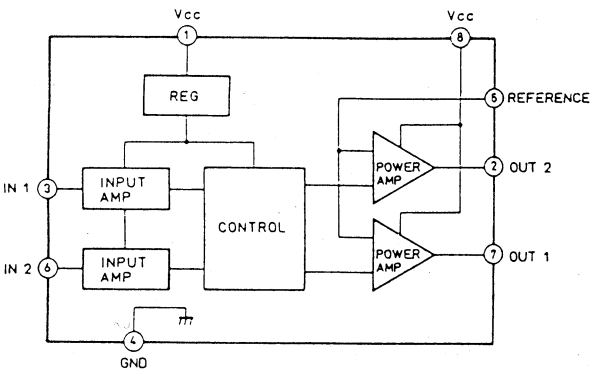


• IC BLOCK DIAGRAMS

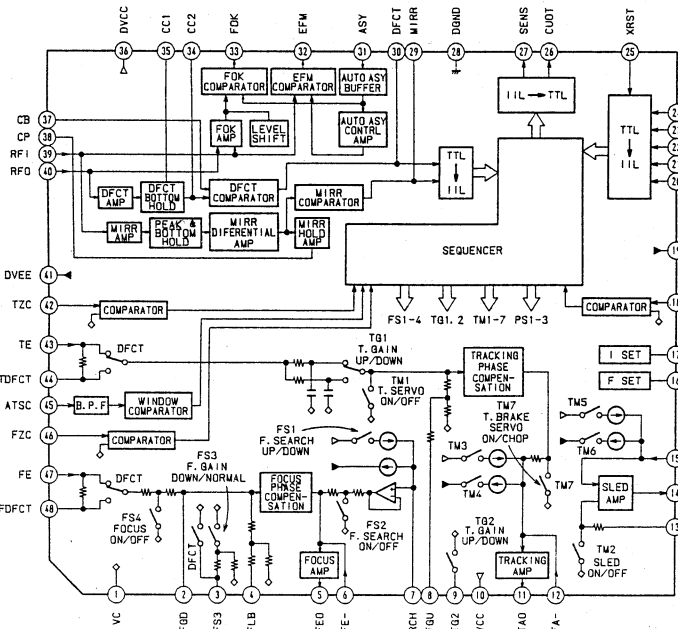
• IC102 LA6532M



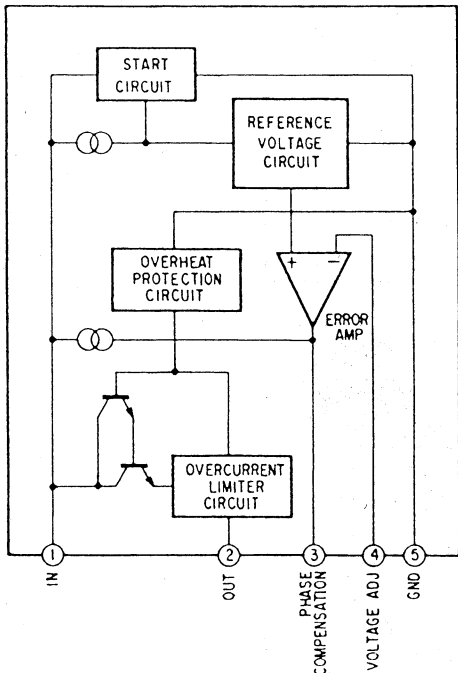
• IC103 M54641L



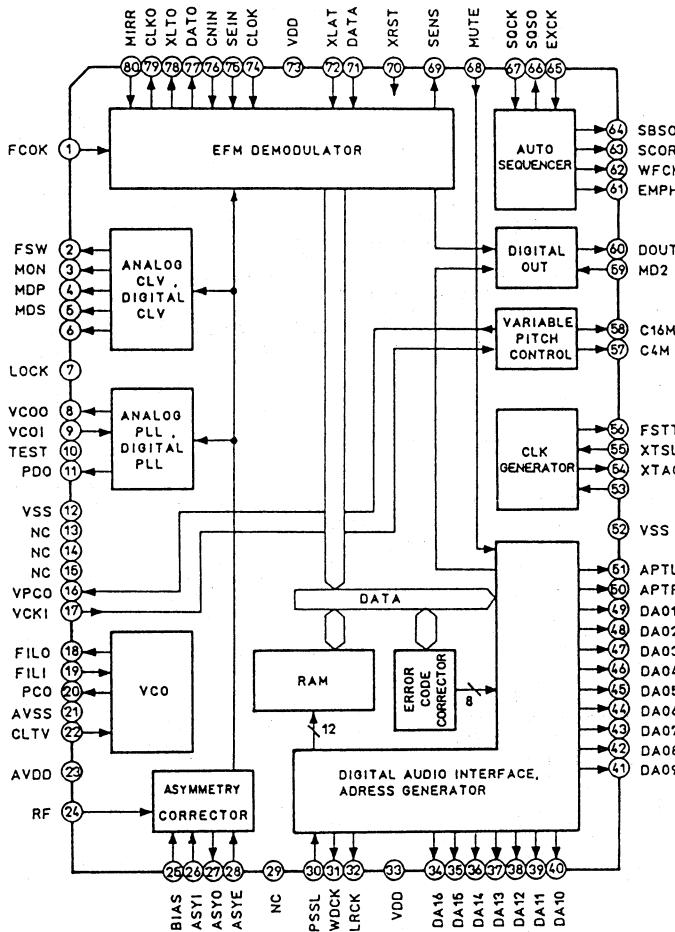
• IC101 CXA1372Q



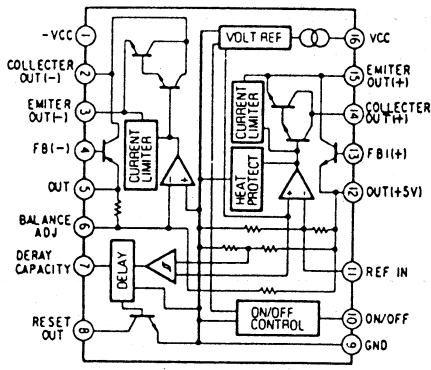
• IC202 M5231TL



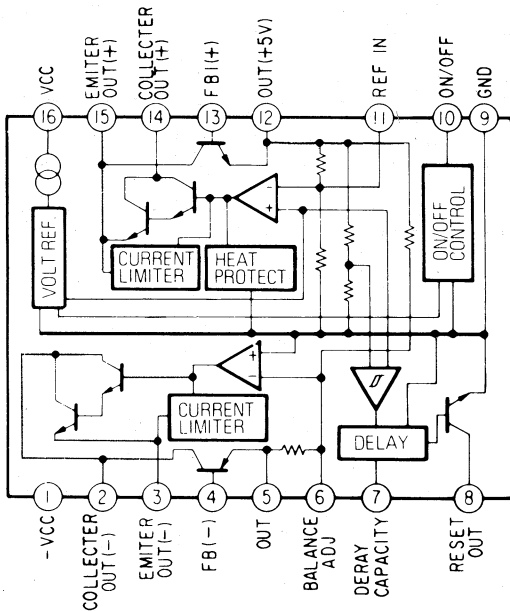
• IC301 CXD2500Q



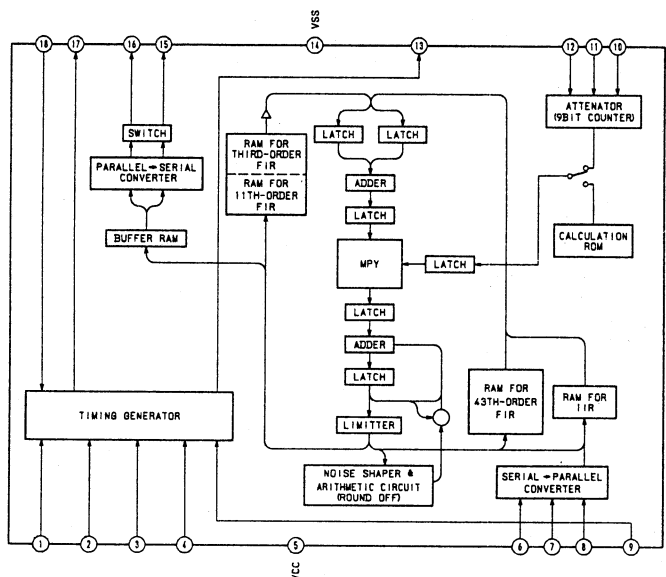
• IC201 M5290P-16



• IC201 M5290P-16



• IC302 CXD2551P



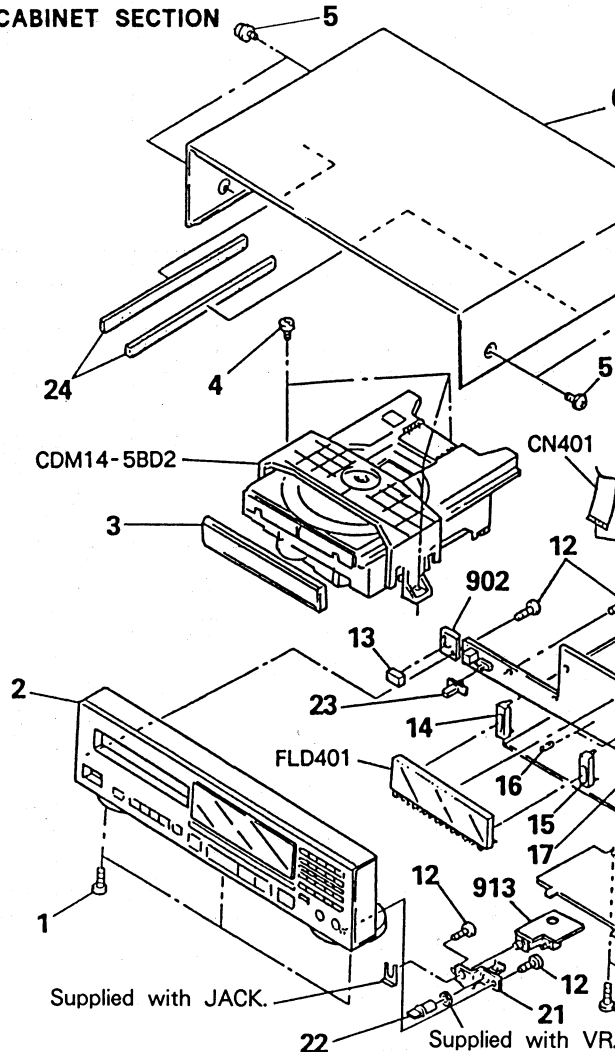
SECTION EXPLODED

NOTE:

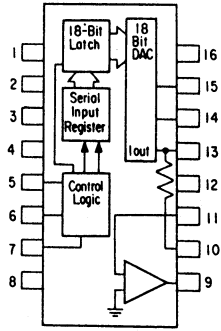
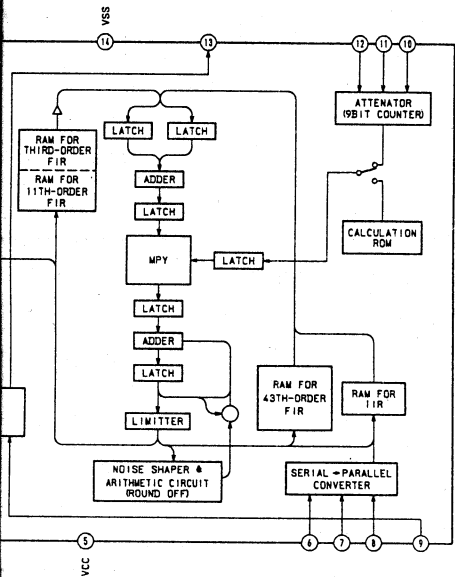
- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- Due to standardization, the number suffix -X is different from the components used.
- Color Indication Example: (RED) ... KNOB
↑
Cabinet's Color

5-1. CABINET SECTION



No.	Part No.	Description	Remarks
1	7-682-547-09	SCREW +BVTT 3X6 (S)	
2	X-4917-593-1	PANEL ASSY, FRONT	
3	4-927-367-01	PANEL, LOADING	
4	7-682-548-04	SCREW +BVTT 3X8 (S)	
5	3-704-366-01	SCREW (CASE) (M3X8)	
6	4-919-376-31	CASE	
7	*3-703-244-00	BUSHING (2104), CORD	
8	4-886-821-11	SCREW, S TIGHT, +PTTW 3X6	
9	*4-929-514-31	(AEP)...PANEL, BACK	
	*4-929-514-61	(UK)...PANEL, BACK	
10	7-682-147-15	SCREW, TR	
11	4-902-345-01	HEAT SINK	
12	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S	
13	4-922-903-01	BUTTON (PW)	
14	*4-922-524-01	HOLDER (LEFT)	
15	*4-922-523-01	HOLDER (RIGHT)	
16	*4-923-532-01	SPACER, LED	
17	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	



SECTION 5 EXPLODED VIEWS

parts with no reference
numbered views are not

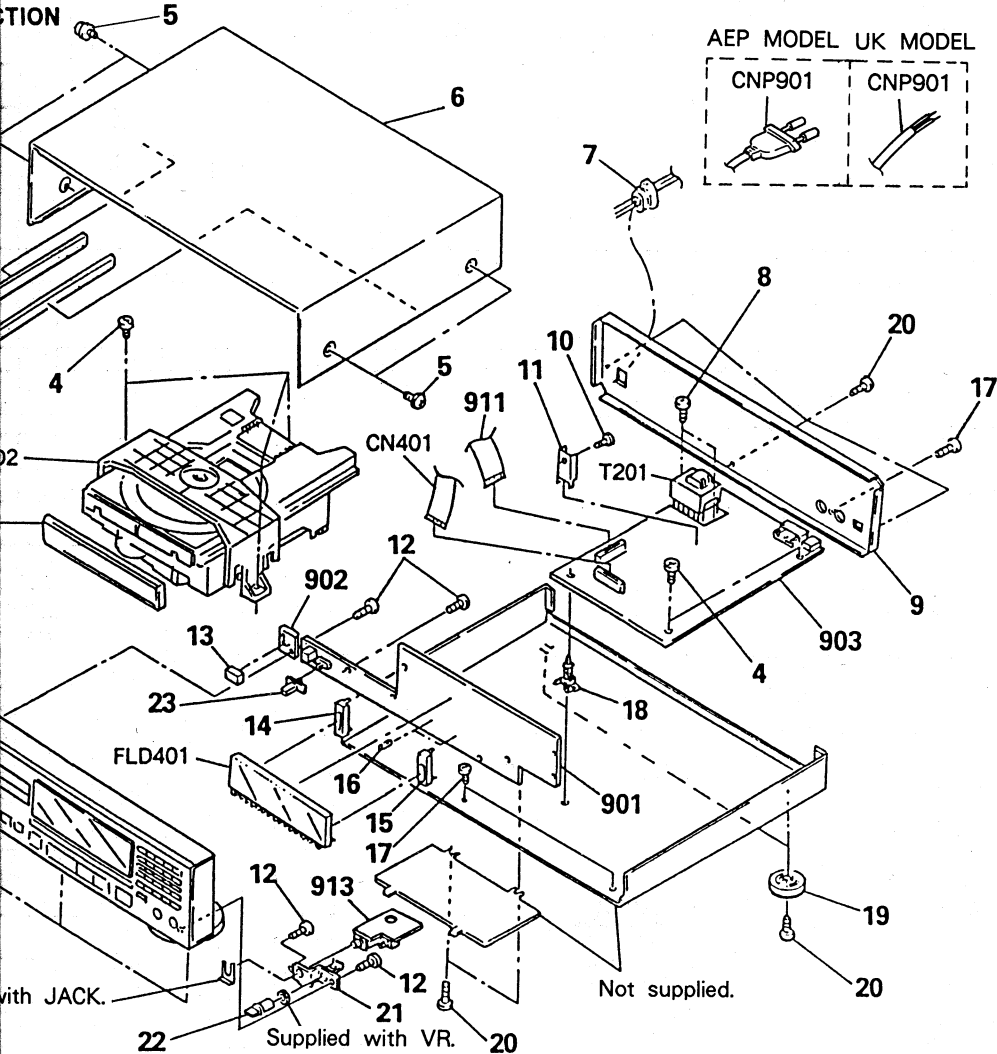
parts of an assembled
unit with a collation num-
ber.

are not stocked since
they are required for routine
maintenance should be antici-
pated these items.

- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts
Example:
(RED) ... KNOB, BALANCE (WHITE)

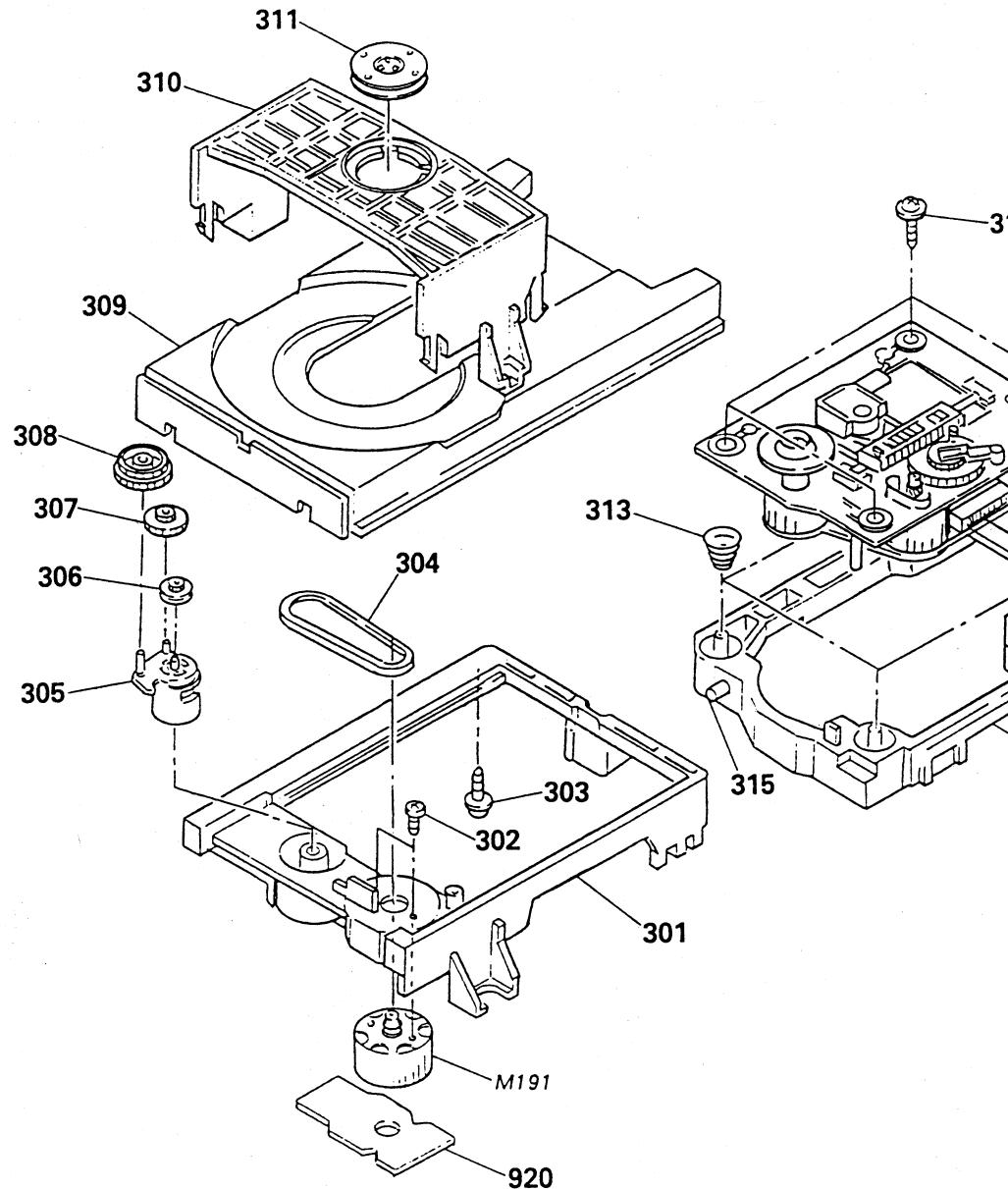
Cabinet's Color Parts Color

The components identified by
mark or dotted line with mark
 are critical for safety.
Replace only with part number
specified.



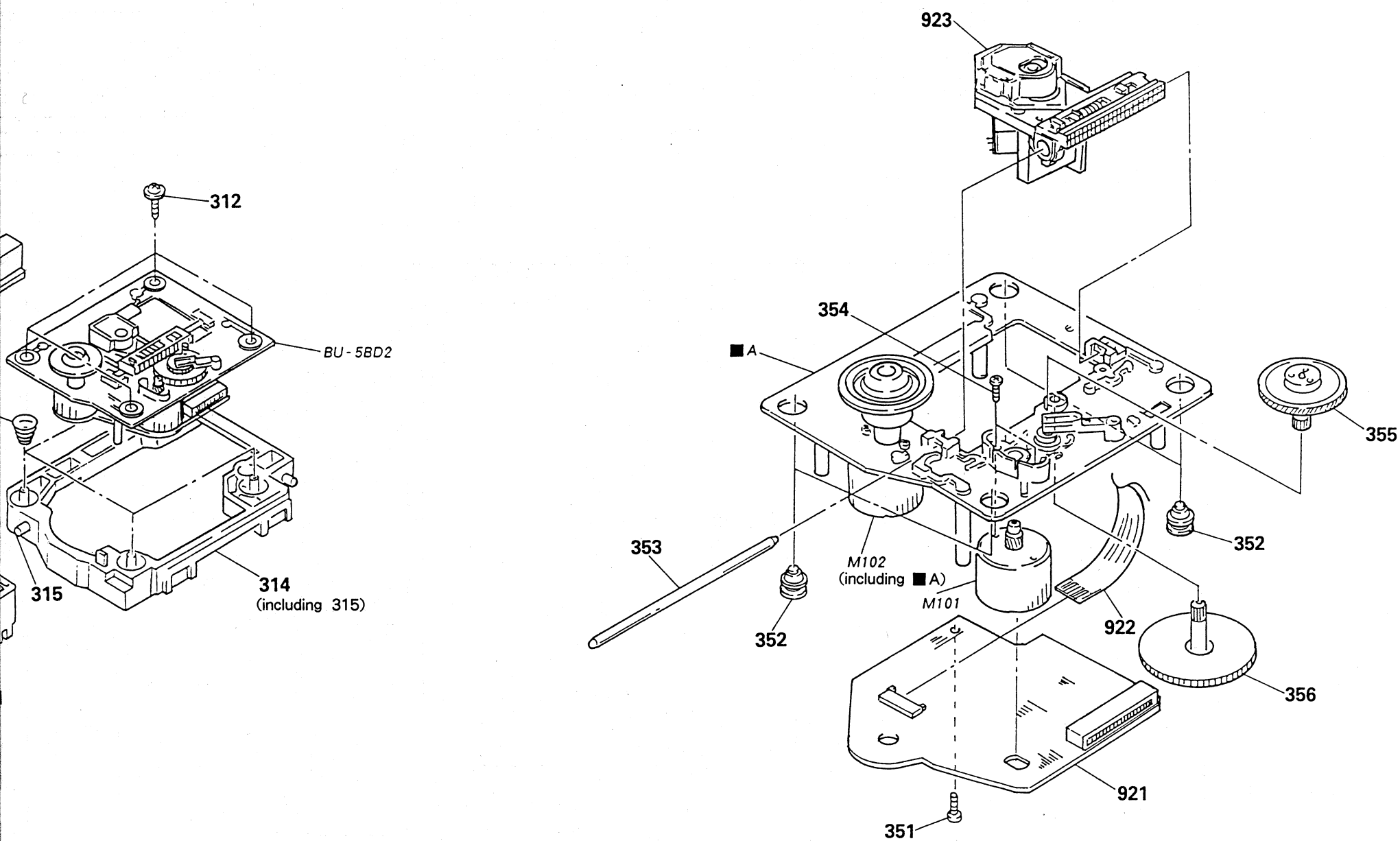
Description	Remarks	No.	Part No.	Description	Remarks
SCREW +BVTT 3X6 (S)		18	*4-924-098-31	HOLDER, PC BOARD	
PANEL ASSY, FRONT		19	4-934-883-01	FOOT	
PANEL, LOADING		20	7-682-548-09	SCREW +BVTT 3X8 (S)	
SCREW +BVTT 3X8 (S)		21	*4-927-365-01	BRACKET (VOL)	
SCREW (CASE) (M3X8)		22	4-922-531-01	KNOB (A TYPE), VOL	
SCREW (CASE) (M3X8)		23	4-924-444-11	KNOB (TIMER)	
SCREW (CASE) (M3X8)		24	*4-929-561-01	CUSHION (CASE)	
SCREW (CASE) (M3X8)		901	*A-4617-317-A	MOUNTED PCB, DISP	
SCREW (CASE) (M3X8)		902	*1-632-724-11	PC BOARD, POWER SWITCH	
SCREW (CASE) (M3X8)		903	*A-4617-318-A	MOUNTED PCB, MAIN	
SCREW (CASE) (M3X8)		911	1-575-160-11	WIRE, FLAT TYPE (22 CORE)	
SCREW (CASE) (M3X8)		913	*1-632-725-11	PC BOARD, HEADPHONE	
SCREW (CASE) (M3X8)		CN401	1-535-809-11	JUMPER, FILM (WITH TERMINAL)	
SCREW (CASE) (M3X8)		CNP901	*1-575-453-11	(AEP)...CORD, POWER	
SCREW (CASE) (M3X8)		CNP901	*1-575-452-11	(UK)...CORD, POWER	
SCREW (CASE) (M3X8)		FLD401	1-519-557-11	INDICATOR TUBE, FLUORESCENT	
SCREW (CASE) (M3X8)		T201	*1-449-922-11	TRANSFORMER, POWER	

5-2. MD SECTION (CDM14-5BD2)



No.	Part No.	Description	Remarks	No.	Part No.	Description
301	4-933-111-01	CHASSIS (MD)		310	4-933-110-01	HOLDER (M)
302	7-621-775-10	SCREW +B 2.6X4		311	A-4675-347-A	MG ASSY
303	*4-917-583-21	BRACKET, YOKE		312	4-933-134-01	SCREW (+P)
304	4-927-649-01	BELT		313	4-917-541-01	SPRING (E)
305	4-933-109-01	CAM		314	4-933-129-01	HOLDER (E)
306	4-927-651-01	PULLEY (S)		315	4-933-108-01	SHAFT (CA)
307	4-927-628-01	GEAR (C)		920	*1-632-202-11	PC BOARD
308	4-933-107-01	GEAR (PL)		M191	A-4604-363-A	MOTOR (L)
309	4-933-112-01	TABLE, DISK				

5-3. OPTICAL PIC-UP SECTION (BU-5BD2)



Note: The components identified by mark $\triangle$ or dotted line with mark $\triangle$ are critical for safety. Replace only with part number specified.

No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
310	4-933-110-01	HOLDER (MG)		351	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S		921	*A-4617-252-A	MOUNTED PCB, BD	
311	A-4675-347-A	MG ASSY		352	4-933-126-01	INSULATOR (A)		922	1-575-001-11	WIRE, FLAT TYPE (12 CORE)	
312	4-933-134-01	SCREW (+PTWH M2.6X6)		353	4-917-565-01	SHAFT, SLED		923	$\triangle$ 8-848-144-11	DEVICE, OPTICAL KSS-240A	
313	4-917-541-01	SPRING (B)		354	7-621-255-15	SCREW +P 2X3		M101	X-4917-504-1	MOTOR ASSY (SLED)	
314	4-933-129-01	HOLDER (BU)		355	4-917-567-01	GEAR (M)		M102	X-4917-523-3	MOTOR ASSY (SPINDLE)	
315	4-933-108-01	SHAFT (CAM)		356	4-917-564-01	GEAR (P), FLATNESS					
920	*1-632-202-11	PC BOARD, LOADING									
M191	A-4604-363-A	MOTOR (L) ASSY									

SECTION 6

ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF: μF , PF: $\mu\mu\text{F}$.

RESISTORS

- All resistors are in ohms.
- F: nonflammable

COLLS

- MMH: mH, UH: μ H

SEMICONDUCTORS

In each case, $U: \mu$, for example:

$$UA...: \mu A..., UPA...: \mu PA...,$$
UPC...: μ PC, UPD...: μ PD...

The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
901	*A-4617-317-A	MOUNTED PCB, DISP	C251	1-126-244-51	ELECT 47000MF 5.5V
902	*1-632-724-11	PC BOARD, POWER SWITCH	C301	1-126-023-11	ELECT 100MF 20% 16V
903	*A-4617-318-A	MOUNTED PCB, MAIN	C302	1-126-301-11	ELECT 1MF 20% 50V
911	1-575-160-11	WIRE, FLAT TYPE (22 CORE)	C304	1-136-161-00	FILM 0.047MF 5% 50V
913	*1-632-725-11	PC BOARD, HEADPHONE	C305	1-161-374-11	CERAMIC 0.0015MF 30% 16V
920	*1-632-202-11	PC BOARD, LOADING	C306	1-164-159-11	CERAMIC 0.1MF 50V
921	*A-4617-252-A	MOUNTED PCB, BD	C307	1-162-306-11	CERAMIC 0.01MF 20% 16V
922	1-575-001-11	WIRE, FLAT TYPE (12 CORE)	C308	1-126-300-11	ELECT 0.47MF 20% 50V
923	△.8-848-144-11	DEVICE, OPTICAL KSS-240A	C309	1-164-159-11	CERAMIC 0.1MF 50V
C101	1-163-038-00	CERAMIC CHIP 0.1MF 25V	C310	1-164-159-11	CERAMIC 0.1MF 50V
C102	1-163-989-11	CERAMIC CHIP 0.033MF 10% 25V	C311	1-164-159-11	CERAMIC 0.1MF 50V
C103	1-126-094-11	ELECT 4.7MF 20% 16V	C312	1-164-159-11	CERAMIC 0.1MF 50V
C104	1-163-038-00	CERAMIC CHIP 0.1MF 25V	C313	1-164-159-11	CERAMIC 0.1MF 50V
C105	1-126-154-11	ELECT 47MF 20% 6.3V	C314	1-164-159-11	CERAMIC 0.1MF 50V
C106	1-126-154-11	ELECT 47MF 20% 6.3V	C315	1-164-159-11	CERAMIC 0.1MF 50V
C107	1-126-154-11	ELECT 47MF 20% 6.3V	C316	1-162-203-31	CERAMIC 15PF 5% 50V
C108	1-163-038-00	CERAMIC CHIP 0.1MF 25V	C317	1-162-205-31	CERAMIC 18PF 5% 50V
C109	1-163-038-00	CERAMIC CHIP 0.1MF 25V	C318	1-126-012-11	ELECT 470MF 20% 16V
C110	1-163-989-11	CERAMIC CHIP 0.033MF 10% 25V	C319	1-126-012-11	ELECT 470MF 20% 16V
C111	1-131-367-00	TANTALUM 22MF 20% 16V	C320	1-130-481-00	MYLAR 0.0068MF 5% 50V
C112	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	C321	1-130-481-00	MYLAR 0.0068MF 5% 50V
C113	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	C322	1-130-475-00	MYLAR 0.0022MF 5% 50V
C114	1-164-161-11	CERAMIC CHIP 0.0022MF 10% 50V	C323	1-130-475-00	MYLAR 0.0022MF 5% 50V
C115	1-164-161-11	CERAMIC CHIP 0.0022MF 10% 50V	C324	1-126-049-11	ELECT 22MF 20% 25V
C116	1-164-161-11	CERAMIC CHIP 0.0022MF 10% 50V	C325	1-126-049-11	ELECT 22MF 20% 25V
C117	1-163-038-00	CERAMIC CHIP 0.1MF 25V	C326	1-130-473-00	MYLAR 0.0015MF 5% 50V
C118	1-163-038-00	CERAMIC CHIP 0.1MF 25V	C327	1-130-473-00	MYLAR 0.0015MF 5% 50V
C119	1-164-161-11	CERAMIC CHIP 0.0022MF 10% 50V	C328	1-162-294-31	CERAMIC 0.001MF 10% 50V
C120	1-163-989-11	CERAMIC CHIP 0.033MF 10% 25V	C329	1-164-159-11	CERAMIC 0.1MF 50V
C151	1-163-019-00	CERAMIC CHIP 0.0068MF 10% 50V	C330	1-162-294-31	CERAMIC 0.001MF 10% 50V
C153	1-163-006-11	CERAMIC CHIP 560PF 10% 50V	C351	1-136-153-00	FILM 0.01MF 5% 50V
C154	1-164-161-11	CERAMIC CHIP 0.0022MF 10% 50V	C352	1-162-294-31	CERAMIC 0.001MF 10% 50V
C171	1-163-038-00	CERAMIC CHIP 0.1MF 25V	C353	1-164-159-11	CERAMIC 0.1MF 50V
C173	1-163-038-00	CERAMIC CHIP 0.1MF 25V	C354	1-164-159-11	CERAMIC 0.1MF 50V
C174	1-163-038-00	CERAMIC CHIP 0.1MF 25V	C355	1-164-159-11	CERAMIC 0.1MF 50V
C201	1-126-842-11	ELECT 4700MF 20% 16V	C356	1-164-159-11	CERAMIC 0.1MF 50V
C202	1-126-842-11	ELECT 4700MF 20% 16V	C357	1-164-159-11	CERAMIC 0.1MF 50V
C203	1-126-880-11	ELECT 100MF 20% 63V	C358	1-164-159-11	CERAMIC 0.1MF 50V
C204	1-126-059-11	ELECT 10MF 20% 50V	C401	1-164-159-11	CERAMIC 0.1MF 50V
C206	1-126-059-11	ELECT 10MF 20% 50V	C402	1-164-159-11	CERAMIC 0.1MF 50V
C207	1-124-045-00	ELECT 4.7MF 20% 50V	C501	1-126-023-11	ELECT 100MF 20% 16V
C208	1-126-059-11	ELECT 10MF 20% 50V	C502	1-126-023-11	ELECT 100MF 20% 16V
C209	1-126-012-11	ELECT 470MF 20% 16V	C503	1-162-290-31	CERAMIC 470PF 10% 50V
C210	1-126-012-11	ELECT 470MF 20% 16V	C504	1-162-290-31	CERAMIC 470PF 10% 50V
C211	1-126-024-11	ELECT 220MF 20% 16V	C505	1-164-159-11	CERAMIC 0.1MF 50V
C212	1-126-024-11	ELECT 220MF 20% 16V			

Ref.No.	Part No.	Description		
C506	1-164-159-11	CERAMIC	0.1MF	50V
C801	1-164-159-11	CERAMIC	0.1MF	50V
C802	1-126-022-11	ELECT	47MF	20% 10V
C803	1-164-159-11	CERAMIC	0.1MF	50V
C804	1-164-159-11	CERAMIC	0.1MF	50V
CN101	1-568-796-11	SOCKET, CONNECTOR 22P		
CN102	1-568-795-11	SOCKET, CONNECTOR 12P		
CN103	*1-564-721-11	PIN, CONNECTOR (SMALL TYPE) 5P		
CN301	*1-564-707-11	PIN, CONNECTOR (SMALL TYPE) 5P		
CN401	1-535-809-11	JUMPER, FILM (WITH TERMINAL)		
CNP201	*1-564-321-00	PIN, CONNECTOR 2P		
CNP301	*1-568-837-11	SOCKET, CONNECTOR 20P		
CNP302	*1-568-822-11	SOCKET, CONNECTOR 22P		
CNP303	*1-564-708-11	PIN, CONNECTOR (SMALL TYPE) 6P		
CNP401	*1-564-498-11	PIN, CONNECTOR 5P		
CNP501	*1-564-708-11	PIN, CONNECTOR (SMALL TYPE) 6P		
CNP901	△1-575-453-11	(AEP)...CORD, POWER		
CNP901	△1-575-452-11	(UK)...CORD, POWER		
D101	8-719-105-72	DIODE RD4.7M-B1		
D201	8-719-200-02	DIODE 10E2		
D202	8-719-200-02	DIODE 10E2		
D203	8-719-200-02	DIODE 10E2		
D204	8-719-200-02	DIODE 10E2		
D205	8-719-200-02	DIODE 10E2		
D206	8-719-107-94	DIODE 1SS202-1		
D207	8-719-111-83	DIODE RD5.1ES-B2		
D208	8-719-110-13	DIODE RD9.1ES-B2		
D209	8-719-110-08	DIODE RD8.2ES-B2		
D251	8-719-107-94	DIODE 1SS202-1		
D301	8-719-107-94	DIODE 1SS202-1		
D401	8-719-107-94	DIODE 1SS202-1		
D402	8-719-107-94	DIODE 1SS202-1		
D403	8-719-107-94	DIODE 1SS202-1		
D404	8-719-107-94	DIODE 1SS202-1		
D405	8-719-107-94	DIODE 1SS202-1		
D406	8-719-107-94	DIODE 1SS202-1		
D407	8-719-107-94	DIODE 1SS202-1		
D408	8-719-907-81	DIODE BG5535S		
D409	8-719-907-75	DIODE AA5534S		
FLD401	1-519-557-11	INDICATOR TUBE, FLUORESCENT		
IC101	8-752-037-33	IC CXA1372Q		
IC102	8-759-821-94	IC LA6532M		
IC103	8-759-633-65	IC M54641L		
IC201	8-759-630-21	IC M5290P-16		
IC202	8-759-605-43	IC M5231TL		
IC301	8-752-333-31	IC CXD2500Q		
IC302	8-752-334-06	IC CXD2551P		
IC303	8-759-990-80	IC CXD8097S		
IC304	8-759-998-23	IC AD1860N-0		
IC305	8-759-998-23	IC AD1860N-0		
IC306	8-759-945-58	IC RC4558P		
IC307	8-759-977-71	IC GP1F31T		
IC308	8-759-803-42	IC LA6500-FA		
IC401	8-759-999-34	IC MSC62408-007GS-K		
IC402	8-749-920-83	IC GP1U52XB		

Ref.No.	Part No.	Description			
IC501	8-759-981-89	IC RC4556S			
IC801	8-759-634-58	IC M37450M8-138FP			
IC802	8-759-822-50	IC LC3564PL-15			
J401	1-566-921-11	JACK, PIN 2P (LINE OUT)			
J501	1-568-498-31	JACK, LARGE TYPE (PHONES)			
JW201	1-216-295-00	METAL GLAZE	0	5%	1/10W
JW202	1-216-295-00	METAL GLAZE	0	5%	1/10W
JW203	1-216-295-00	METAL GLAZE	0	5%	1/10W
JW204	1-216-295-00	METAL GLAZE	0	5%	1/10W
M101	X-4917-504-1	MOTOR ASSY (SLED)			
M102	X-4917-523-3	MOTOR ASSY (SPINDLE)			
M191	A-4604-363-A	MOTOR (L) ASSY			
PS201	△1-532-637-00	LINK, IC			
PS202	△1-532-675-00	LINK, IC			
Q101	8-729-901-01	TRANSISTOR DTC144EK			
Q201	8-729-111-67	TRANSISTOR 2SB1094-1			
Q202	8-729-140-96	TRANSISTOR 2SD774-34			
Q203	8-729-111-67	TRANSISTOR 2SB1094-1			
Q204	8-729-230-45	TRANSISTOR 2SC2458-YGR			
Q205	8-729-900-80	TRANSISTOR DTC114ES			
Q206	8-729-230-45	TRANSISTOR 2SC2458-YGR			
Q301	8-729-900-89	TRANSISTOR DTC144ES			
Q302	8-729-900-65	TRANSISTOR DTA144ES			
Q303	8-729-115-88	TRANSISTOR BA1L3Z-K			
Q304	8-729-115-88	TRANSISTOR BA1L3Z-K			
Q305	8-729-115-88	TRANSISTOR BA1L3Z-K			
Q306	8-729-115-88	TRANSISTOR BA1L3Z-K			
Q401	8-729-900-45	TRANSISTOR DTC114EF			
Q402	8-729-900-45	TRANSISTOR DTC114EF			
Q403	8-729-900-45	TRANSISTOR DTC114EF			
R101	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R102	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R103	1-216-091-00	METAL GLAZE	56K	5%	1/10W
R104	1-216-099-00	METAL GLAZE	120K	5%	1/10W
R105	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W
R106	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R107	1-216-114-00	METAL GLAZE	510K	5%	1/10W
R108	1-216-105-00	METAL GLAZE	220K	5%	1/10W
R109	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R110	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R111	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R112	1-216-083-00	METAL GLAZE	27K	5%	1/10W
R113	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W
R114	1-216-105-00	METAL GLAZE	220K	5%	1/10W
R154	1-216-085-00	METAL GLAZE	33K	5%	1/10W
R155	1-216-093-00	METAL GLAZE	68K	5%	1/10W
R157	1-216-079-00	METAL GLAZE	18K	5%	1/10W
R158	1-216-079-00	METAL GLAZE	18K	5%	1/10W
R159	1-216-079-00	METAL GLAZE	18K	5%	1/10W
R160	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R171	1-216-001-00	METAL GLAZE	10	5%	1/10W
R173	1-216-001-00	METAL GLAZE	10	5%	1/10W
R174	1-216-001-00	METAL GLAZE	10	5%	1/10W
R201	1-249-425-11	CARBON	4.7K	5%	1/4W
R202	1-249-425-11	CARBON	4.7K	5%	1/4W
R205	1-249-435-11	CARBON	33K	5%	1/4W
R206	1-249-413-11	CARBON	470	5%	1/4W

Note: The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description							
R207	1-249-429-11	CARBON	10K	5%	1/4W				
R208	1-249-423-11	CARBON	3.3K	5%	1/4W				
R209	1-249-417-11	CARBON	1K	5%	1/4W				
R210	1-249-417-11	CARBON	1K	5%	1/4W				
R211	1-249-411-11	CARBON	330	5%	1/4W				
R251	1-247-874-11	CARBON	62K	5%	1/4W				
R252	1-249-423-11	CARBON	3.3K	5%	1/4W				
R253	1-249-417-11	CARBON	1K	5%	1/4W				
R255	1-249-405-11	CARBON	100	5%	1/4W				
R256	1-249-429-11	CARBON	10K	5%	1/4W				
R257	1-249-438-11	CARBON	56K	5%	1/4W				
R301	1-249-411-11	CARBON	330	5%	1/4W				
R308	1-249-423-11	CARBON	3.3K	5%	1/4W				
R309	1-249-423-11	CARBON	3.3K	5%	1/4W				
R310	1-249-429-11	CARBON	10K	5%	1/4W				
R311	1-249-429-11	CARBON	10K	5%	1/4W				
R312	1-249-441-11	CARBON	100K	5%	1/4W				
R313	1-249-417-11	CARBON	1K	5%	1/4W				
R314	1-249-417-11	CARBON	1K	5%	1/4W				
R315	1-249-417-11	CARBON	1K	5%	1/4W				
R316	1-249-413-11	CARBON	470	5%	1/4W				
R317	1-249-411-11	CARBON	330	5%	1/4W				
R318	1-249-411-11	CARBON	330	5%	1/4W				
R319	1-249-417-11	CARBON	1K	5%	1/4W				
R320	1-249-414-11	CARBON	560	5%	1/4W				
R321	1-247-903-00	CARBON	1M	5%	1/4W				
R322	1-249-407-11	CARBON	150	5%	1/4W				
R323	1-249-411-11	CARBON	330	5%	1/4W				
R324	1-249-411-11	CARBON	330	5%	1/4W				
R325	1-249-413-11	CARBON	470	5%	1/4W				
R326	1-249-417-11	CARBON	1K	5%	1/4W				
R327	1-249-417-11	CARBON	1K	5%	1/4W				
R328	1-249-417-11	CARBON	1K	5%	1/4W				
R329	1-249-417-11	CARBON	1K	5%	1/4W				
R330	1-249-417-11	CARBON	1K	5%	1/4W				
R331	1-247-891-00	CARBON	330K	5%	1/4W				
R332	1-247-891-00	CARBON	330K	5%	1/4W				
R333	1-249-409-11	CARBON	220	5%	1/4W				
R334	1-249-409-11	CARBON	220	5%	1/4W				
R335	1-249-409-11	CARBON	220	5%	1/4W				
R336	1-249-409-11	CARBON	220	5%	1/4W				
R337	1-249-414-11	CARBON	560	5%	1/4W				
R338	1-249-414-11	CARBON	560	5%	1/4W				
R341	1-249-441-11	CARBON	100K	5%	1/4W				
R345	1-249-405-11	CARBON	100	5%	1/4W				
R346	1-249-405-11	CARBON	100	5%	1/4W				
R347	1-249-433-11	CARBON	22K	5%	1/4W				
R348	1-249-433-11	CARBON	22K	5%	1/4W				
R351	1-249-429-11	CARBON	10K	5%	1/4W				
R352	1-249-429-11	CARBON	10K	5%	1/4W				
R353	1-249-435-11	CARBON	33K	5%	1/4W				
R354	1-247-883-00	CARBON	150K	5%	1/4W				
R355	1-249-433-11	CARBON	22K	5%	1/4W				
R356	1-247-878-00	CARBON	91K	5%	1/4W				
R357	1-247-883-00	CARBON	150K	5%	1/4W				
R358	1-249-393-11	CARBON	10	5%	1/4W				
R401	1-249-429-11	CARBON	10K	5%	1/4W				
R402	1-249-407-11	CARBON	150	5%	1/4W				
R403	1-249-409-11	CARBON	220	5%	1/4W				
R404	1-247-903-00	CARBON	1M	5%	1/4W				
R405	1-249-429-11	CARBON	10K	5%	1/4W				
R501	1-249-417-11	CARBON	1K	5%	1/4W				
R502	1-249-417-11	CARBON	1K	5%	1/4W				
R503	1-249-437-11	CARBON	47K	5%	1/4W				
R504	1-249-437-11	CARBON	47K	5%	1/4W				
R505	1-249-424-11	CARBON	3.9K	5%	1/4W				
R506	1-249-424-11	CARBON	3.9K	5%	1/4W				
R507	1-249-405-11	CARBON	100	5%	1/4W				
R508	1-249-405-11	CARBON	100	5%	1/4W				
R801	1-249-429-11	CARBON	10K	5%	1/4W				
R803	1-249-429-11	CARBON	10K	5%	1/4W				
R804	1-249-429-11	CARBON	10K	5%	1/4W				
R805	1-249-429-11	CARBON	10K	5%	1/4W				
R806	1-249-429-11	CARBON	10K	5%	1/4W				
R807	1-249-417-11	CARBON	1K	5%	1/4W				
R808	1-249-417-11	CARBON	1K	5%	1/4W				
R809	1-249-417-11	CARBON	1K	5%	1/4W				
R813	1-247-903-00	CARBON	1M	5%	1/4W				
R814	1-249-429-11	CARBON	10K	5%	1/4W				
R815	1-249-429-11	CARBON	10K	5%	1/4W				
R816	1-249-429-11	CARBON	10K	5%	1/4W				
R817	1-249-429-11	CARBON	10K	5%	1/4W				
R818	1-249-429-11	CARBON	10K	5%	1/4W				
R819	1-249-429-11	CARBON	10K	5%	1/4W				
R820	1-249-429-11	CARBON	10K	5%	1/4W				
R821	1-249-429-11	CARBON	10K	5%	1/4W				
RV101	1-238-016-11	RES, ADJ, CARBON 10K (TRACKING GAIN)							
RV102	1-238-016-11	RES, ADJ, CARBON 10K (FOCUS GAIN)							
RV501	1-238-403-21	RES, VAR, CARBON 20K/20K (PHONES LEVEL)							
S101	1-572-085-11	SWITCH, LEAF (LIMIT SW)							
S191	1-572-086-11	SWITCH, LEAF (IN)							
S192	1-572-086-11	SWITCH, LEAF (OUT)							
S401	1-554-596-21	SWITCH, KEY BOARD (FADER)							
S402	1-554-596-21	SWITCH, KEY BOARD (TIMER/MEMO)							
S403	1-554-596-21	SWITCH, KEY BOARD (PEAK SENSOR)							
S404	1-554-596-21	SWITCH, KEY BOARD (OPEN/CLOSE)							
S405	1-554-596-21	SWITCH, KEY BOARD (▷)							
S406	1-554-596-21	SWITCH, KEY BOARD (MULTI PGM)							
S407	1-554-596-21	SWITCH, KEY BOARD (C.INDEX)							
S408	1-554-596-21	SWITCH, KEY BOARD (PROGRAM)							
S409	1-554-596-21	SWITCH, KEY BOARD (SHUFFLE)							
S410	1-554-596-21	SWITCH, KEY BOARD (CONTINUE)							
S411	1-554-596-21	SWITCH, KEY BOARD (1)							
S412	1-554-596-21	SWITCH, KEY BOARD (16)							
S413	1-554-596-21	SWITCH, KEY BOARD (11)							
S414	1-554-596-21	SWITCH, KEY BOARD (16)							
S415	1-554-596-21	SWITCH, KEY BOARD (FILE)							
S416	1-554-596-21	SWITCH, KEY BOARD (▷▷)							
S417	1-554-596-21	SWITCH, KEY BOARD (▷▷▷)							
S418	1-554-596-21	SWITCH, KEY BOARD (2)							
S419	1-554-596-21	SWITCH, KEY BOARD (7)							
S420	1-554-596-21	SWITCH, KEY BOARD (12)							
S421	1-554-596-21	SWITCH, KEY BOARD (17)							

Ref.No.	Part No.	Description
S422	1-554-596-21	SWITCH, KEY BOARD (ERASE)
S423	1-554-596-21	SWITCH, KEY BOARD (<K)
S424	1-554-596-21	SWITCH, KEY BOARD (K<)
S425	1-554-596-21	SWITCH, KEY BOARD (3)
S426	1-554-596-21	SWITCH, KEY BOARD (8)
S427	1-554-596-21	SWITCH, KEY BOARD (13)
S428	1-554-596-21	SWITCH, KEY BOARD (18)
S429	1-554-596-21	SWITCH, KEY BOARD (CHECK)
S430	1-554-596-21	SWITCH, KEY BOARD (FILE RECALL)
S431	1-554-596-21	SWITCH, KEY BOARD (■)
S432	1-554-596-21	SWITCH, KEY BOARD (4)
S433	1-554-596-21	SWITCH, KEY BOARD (9)
S434	1-554-596-21	SWITCH, KEY BOARD (14)
S435	1-554-596-21	SWITCH, KEY BOARD (19)
S436	1-554-596-21	SWITCH, KEY BOARD (CLEAR)
S437	1-554-596-21	SWITCH, KEY BOARD (REPEAT)
S438	1-554-596-21	SWITCH, KEY BOARD (III)
S439	1-554-596-21	SWITCH, KEY BOARD (5)
S440	1-554-596-21	SWITCH, KEY BOARD (10)
S441	1-554-596-21	SWITCH, KEY BOARD (15)
S442	1-554-596-21	SWITCH, KEY BOARD (20)
S443	1-554-596-21	SWITCH, KEY BOARD (>20)
S444	1-554-596-21	SWITCH, KEY BOARD (EDIT/TIME FADE)
S445	1-554-596-21	SWITCH, KEY BOARD (TIME SET)
S446	1-554-481-00	SWITCH, SLIDE (TIMER)
S447	1-571-305-11	SWITCH, PUSH (1 KEY)(POWER)
T201	1-449-922-11	TRANSFORMER, POWER
X301	1-567-926-11	VIBRATOR, CRYSTAL (16.9MHz)
X401	1-577-082-11	VIBRATOR, CERAMIC (4MHz)
X801	1-577-377-11	VIBRATOR, CERAMIC (10MHz)

ACCESSORY & PACKING MATERIAL

1-465-279-11	REMOTE COMMANDER
1-559-533-11	CORD, CONNECTION
3-751-391-11	MANUAL, INSTRUCTION
3-751-391-41	(AEP)...MANUAL, INSTRUCTION
*3-795-629-11	(AEP)...INSTRUCTION
*4-922-998-01	CUSHION
*4-927-392-11	INDIVIDUAL CARTON

Note: The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.